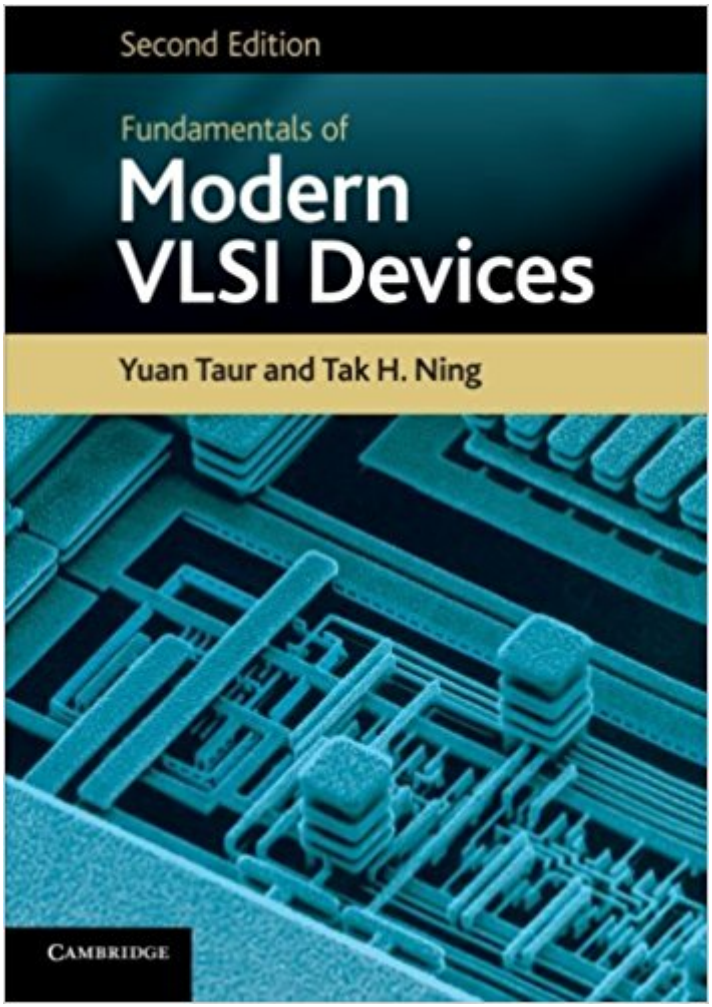
Fundamentals Of Modern VLSI Devices



Synopsis

Learn the basic properties and designs of modern VLSI devices, as well as the factors affecting performance, with this thoroughly updated second edition. The first edition has been widely adopted as a standard textbook in microelectronics in many major US universities and worldwide. The internationally renowned authors highlight the intricate interdependencies and subtle trade-offs between various practically important device parameters, and provide an in-depth discussion of device scaling and scaling limits of CMOS and bipolar devices. Equations and parameters provided are checked continuously against the reality of silicon data, making the book equally useful in practical transistor design and in the classroom. Every chapter has been updated to include the latest developments, such as MOSFET scale length theory, high-field transport model and SiGe-base bipolar devices.

Book Information

Paperback: 678 pages

Publisher: Cambridge University Press; 2 edition (June 24, 2013)

Language: English

ISBN-10: 1107635713

ISBN-13: 978-1107635715

Product Dimensions: 6.8 x 1.2 x 9.7 inches

Shipping Weight: 3 pounds (View shipping rates and policies)

Average Customer Review: 4.1 out of 5 stars 16 customer reviews

Best Sellers Rank: #684,636 in Books (See Top 100 in Books) #29 inÃ Â Books > Engineering & Transportation > Engineering > Electrical & Electronics > Circuits > VLSI & ULSI #41 inÃ Â Books > Engineering & Transportation > Engineering > Electrical & Electronics > Electronics > Optoelectronics #143 inÃ Â Books > Computers & Technology > Programming > Software Design, Testing & Engineering > Logic

Customer Reviews

"For the past several years, I’ve taught from Taur and Ning’s book because it’s best at connecting advanced device physics to real world device, circuit, and system technology. The second edition updates each chapter, adds new chapters on memory and SOI, doubles the number of appendices, and contains all new homework problems. The best book of its kind is now even better." Mark Lundstrom, Purdue University"I have taught a few VLSI device courses with the 1st edition as a textbook. Those were enjoyable experiences and the book was well received by students. Now the

second edition comes with timely updates and two new chapters, which continue the tradition of emphasizing the design aspects of modern VLSI devices. I strongly recommend this book as a text or a reference in semiconductor device courses." Byung-Gook Park, Seoul National University"Fundamentals of Modern VLSI Devices, by Taur and Ning, has been an important reference text for our graduate semiconductor device physics course at UC Berkeley for several years. It provides a well-written review of the operation of MOSFETs and BJTs. The new edition expands on this by introducing major new topics related to memories, silicon on insulator devices, and scale length and high field modeling as applied to MOSFETs. By including this material, this text is now positioned to be the primary text for typical graduate device physics courses, and will meet the needs of both students and instructors through it’s combination of detailed, well-written, and easy to follow descriptions of device operation, coupled with exercises and assignments for testing understanding of the relevant course material." Vivek Subramanian, UC Berkeley"This second edition of Fundamentals of Modern VLSI Devices builds on the tremendous success enjoyed by the original book. It provides well-organized and in-depth discussions on all relevant aspects of modern MOSFET and BJT devices, with an excellent balance of physics and mathematics. Every chapter is revised to reflect advances in VLSI devices in the last 10 years since the publication of the original book. Two new chapters on memory and silicon-on-insulator devices have been included along with nine additional appendixes. The problems at the end of each chapter are carefully designed and serve to help the readers better understand the key concepts." Wei Lu, University of Michigan

Learn the basic properties and designs of modern VLSI devices, as well as the factors affecting performance, with this thoroughly updated second edition. The internationally renowned authors highlight the interdependencies and trade-offs between practically important device parameters and discuss device scaling and scaling limits of CMOS and bipolar devices.

This is the best book currently available on device electronics. Written by renown contributors to the field from IBM, it takes the complexity of integrated semiconductor devices down to its first-order, industry-proven essentials. In this respect, "Fundamentals of Modern VLSI Devices" comes in line with what I consider to be the epitoms of the class of lasting transistor books, Alvin Phillips’ "Transistor Engineering" (McGraw-Hill 1962) and Andrew Grove’s "Physics and Technology of Semiconductor Devices" (Wiley, 1967). The treatment of the subject matter is outstandingly thorough, covering the basic device physics and technology integration of bipolar and field-effect

metal-oxide-semiconductor (MOSFET) and highlighting the subtle tradeoffs involved in modern transistor design and optimization. The approach is first-order analytical, with refrainment from the use of computer-simulations tools that would have run the risk of diminishing the teaching strength of the book. Equations and parameters provided are checked continuously against the reality of silicon data. This makes the book invaluably useful in practical transitor design as well as in the classroom. I keep it on my desk at all times. The bipolar-transitor part takes the reader all the way from the classical junction transistor to the modern polysilicon-emitter, SiGe-base variety. The MOSFET part is equally sweeping, coming as far as to the technology node (gate length) of 100 nm. Each chapter concludes with real-life exercises that actually extend the depth of analysis, getting the reader directly involved.

I must revise my previous comment about this book. I am suprised to find this 2nd edition was re-printed in 2012. The quality of this reprinted version is as good as I expect. the binding is good. I thought to increase the rating to 5 star. But one thing make me to rate one star to 4 star. Why the seller did not state the bad quality of binding of 2009-edition hardcover? We want to pay for a good book, not only good in content but also in quality.//In fact this is the one of the first books about device physics I have ever read. I have no background in device design but I am interested in and have some knowledge of the physics in device. I learn a lot after I finish the first round of read of this book. You need to have some basic knowledge of device physics before reading the book. You cannot only rely on this book to be a guru in device physics. What this book does best is to show all the relevant aspects in device physics and add proper amount of equation to make explanation. This is too concise for the beginner to understand but it is good for an engineer involved in this field for several years.I have to mention that there are some bolded words in each chapter of the book. They are in fact the insight from author’s tens of years of device design experience. I stronly recommend you to read and read again. This book is not for one-time use. You must read it and think about the words and equations again and again. From the content and organization of this book I rate it 4.5 or 5 star.But what really disappoint me is that the binding quality of hardcover version is too bad. I always buy hardcover version book if I think the author is authoritive in the field and the content and writing is very good. I am afraid that my book will fall apart after frequent of use. I am not sure if this is the reason why the price of hardcover is slash down to close to the paperback. I rate 2 star for its binding quality.So the total is 3 or 3.5 star.

If you seek to understand devices from a physical point of view this book just fails to live up to it.I

read the chapters on MOSFETs' thoroughly and also the section of second chapter which describes MOS capacitor.The feel you get when you read the book is somewhat hard to write, it has all the relevant equations but lacks a physical insight.For example the quantum confinement of the inversion layer is so briefly described that someone reading the topic for the first time will never be able to make sense out of it.For those who know device physics, rather well, this book provides great material, drawn primarily from the authors' experience at IBM's T J watson research lab.As a suggestion Dr.Taur has a few papers, available online for free download at IBM's research and development journal,it will be a good idea to explore it and the other allied material appearing there.For the starter I will suggest to pick up Tsividis book on "Operation and modeling of MOS Transistor" and concurrently try the present volume.A better physical model can be developed.

I like this book because it is very organized written and it explains the concepts in a very intuitive and clear way. Good textbook for grad students learning device fundamentals. But it may be too simplified for the people who want to know all the details and physical origins.

Good quality

Electronics Fundamentals: Circuits, Devices & Applications (8th Edition) Fundamentals of III-V Devices: HBTs, MESFETs, and HFETs/HEMTs Contemporary Electronics: Fundamentals, Devices, Circuits, and Systems Optofluidics: Fundamentals, Devices, and Applications (McGraw-Hill Biophotonics) Point-of-Care Ultrasound Fundamentals: Principles, Devices, and Patient Safety Drug Delivery Devices: Fundamentals and Applications (Drugs and the Pharmaceutical Sciences)